Project Managers' Advisory Group

MINUTES
March 21, 2011

Attending: **(* = by phone)**

Bob Giannuzzi	EPMO
Kathy Bromead	EPMO
Charles Richards	EPMO
Jesus Lopez	EPMO
Janet Stewart	EPMO
Alisa Cutler*	EPMO
Anita Ward	OSC
Vicky Kumar*	OSC
Lucy Cornelius*	DPI
John O'Shaughnessy*	ITS
John McShane*	ITS
Sarah Liles*	DHHS DMA
Ellen Zimmerman*	DHHS DPH
Gary Lapio*	DHHS DIRM
Karen Guy*	DHHS DIRM
Deanna Perry*	DHHS DIRM
Subhapratha Sridharan*	DHHS DIRM
Mark Massengill*	DHHS DMA
Larry Sanders*	ESC
Jodi Bone*	ESC
Lloyd Slominsky*	Dept. of Corrections
Cheryl Ritter*	DOT
Chris Cline*	NCCCS
Colleen McCarthy*	SOS
David Johnson*	DENR

Bob Giannuzzi welcomed everyone to the meeting. Anita Ward (OSC) was introduced as a first time attendee.

Bob solicited and received approval of the February minutes.

Jesus Lopez again advised that the EPMO will conduct PMP Exam Prep Class Cycle 12 commencing with the Kickoff session on April 5. The class has room for more students. Anyone interested in attending should contact Jesus. Bob suggested that any recent participant who passed the exam may want to sell or lend their books. Anyone interested in doing so should contact the EPMO.

Jesus then presented Anita Ward a framed congratulatory letter from the State CIO in recognition of her recent passing of the PMP exam. She attended the last exam prep class.

Bob advised that the Office of the SCIO is soliciting candidates for this year's NASCIO IT project awards. A one paragraph description is due 4/13. Details of the process are being distributed with these minutes.

Bob recommended that PMPs Google *free PM webinars* to find opportunities for free PDUs. John McShane pointed out that NCPMI is looking for volunteers to work the entire annual event (from now to December). They will earn 3 PDUs + free admission to the conference + PDUs for sessions attended. This is a select group of 7 key individuals (including chair) who are responsible for 'driving' the annual event to closure. Those interested need to contact John this month or sign up just prior to the March chapter meeting. Vicky Kumar added that a call for speakers is imminent. Annual Event speakers would earn one PDU for each hour invested for presentation and preparation + two free admission passes to the conference.

Bob reported the following upcoming events at NCPMI and PMI webinars:

NCPMI Venue	Speaker	Date/Topic
General Membership	Sandy Costa	March 24 (6:00 PM) Humanity at Work: Encouraging Spirit, Achievement and Truth to Flourish in the Workplace
Public Sector LIG	Manoj Pandya	April 7 (6:00 PM) DOT Grant Management System
PMO Committee	Bill Stewart	March 23 (6:00 PM) Traits of Great Project Managers and Great PMO's and How to Sell Their Value
Leadership Committee		No meeting scheduled
Information Systems Committee		No meeting scheduled
Free Webinar (must subscribe to Ethics in Project Management CoP)	Philip R. Diab	March 31 (3;00 pm – 4:00 PM) Why Ethics Matter in Project Management

Kathy Bromead announced that Linda Lowe has resigned from state government effective 4/1. Since no backfill will be available, PMA responsibilities will be redistributed. Valerie Maat will be serving as DOT's PMA, while Charles Richards and Janet Stewart will be assigned to some of the smaller agencies, with guidance from the other PMAs.

Kathy reviewed the recently revised EPMO Value Proposition. The document highlights how well the EPMO is executing its eight key value goals. It will be available on the EPMO website with the 3/30 process release.

The progress of the EPMO work groups was discussed next.

- **SDLC** to address integration of alternate SDLCs (e.g., Agile) into the current process/workflow. Kathy reported that the group has drafted a separate PPM workflow for Agile development to be reviewed at their 4/1 meeting.
- **Agency Procurement** to develop a common (within agency) procurement process. The final documentation will be available 3/30 via the EPMO website.

- **Business Case** to develop guidelines and provide training on justifying projects based on cost/benefits analysis. Bob reported that the group has drafted cost/benefit analysis templates that are being refined. A charter has also been drafted.

Alisa Cutler reported on Methodology Task Group activity. She reviewed the latest draft of the RASCI template (sent out with these minutes) and asked for the group's feedback by 3/28. They will next address the Communication Plan document. Alisa also solicited suggestions for other templates/documents.

Charles Richards reminded the group of the 3/29 Status Reporting training session (AdobeConnect).

Janet Stewart advised that the next process release will be available 3/30 on the EPMO Website. Besides what's already been cited, it will include a change in the requirements for Registration actuals entry to Level 2. Kathy will also post a newsletter.

Kathy advised that the EPMO has collected data from several projects' issues and categorized them. She solicited volunteers to work with the EPMO to analyze this information as lessons learned to hopefully reduce the number of future issues raised. This effort should be available for discussion at next month's meeting.

Lessons Learned from recently closed projects are included in the Appendix.

Meeting adjourned at 4:18 PM.

NEXT MEETING

Monday, April 18, 2011 at 3:30
333 Six Forks Road Conference Room 5 or (919) 981-5581

https://its.ncgovconnect.com/r96139571/

APPENDIX

Lessons Learned Documentation

Exhibit A

DHHS - NC FAST Automated Interview (AI) Integrator Selection

Initiation Phase:

Topic	Lessons Learned
1. Business Case / Project Charter	Positive – This project had strong sponsorship
2. Benefits	Negative– Confusion early on how to account for Benefits. Project scope includes only the procurement process through contract award.
3. Procurement Plan (procurement strategy….build vs. buy)	Positive – This exercise was accomplished to determine that an integrator was required to implement the COTS framework was the correct course of action before this project was initiated.
4. Project Approval Process	Positive–Project completed the SB991 process effectively as part of the approval process
5. Managing Sponsor Expectations	Positive–Monthly Executive Advisory Council (EAC) Meetings were used to communicate status and manage sponsor expectations.
6. Managing Customer Expectations	Positive–Agency and County representation also attended EAC meetings

Planning & Design Phase:

Topic	Lessons Learned
1. Updated Business Case	Positive – the business case required very little updating since it was created.
2. Updated Budget	Negative – When the initial costs of the project were estimated, the project included the project's share of the overall operating costs. However, the project team learned during P&D that the overall operating expenses would be assigned to the program.
3. Updated Benefits	Positive – very little updated was required
4. Updated Procurement Plan	Positive – The project team was able to develop a document that covered all projects in process
5. Managing Sponsor Expectations	Same as above
6. Managing Customer Expectations	Same as above
7. Risk Management	Positive – a formal risk assessment was conducted, documented and tracked
8. Issue Management	Positive–a issue log was utilized to categorize and track issues
9. Monthly Status Reporting	Neutral–On numerous occasions the monthly financials were not available when the monthly status was due. It did seem to improve as time went on.
10. Requirements Mapping	Positive–The project team had over 11,000 Business System Functions (BSF). The project team kept these updated during the project and utilized the BSF in the during the proposal evaluations.

Execution & Build Phase:

Topic	Lessons Learned
1. Project Approval Process	Positive–Steps were known for gate approval.
2. Managing Sponsor Expectations	Same as above
3. Managing Customer Expectations	Same as above
4. Risk Management	Same as above
5. Issue Management	Same as above
6. Monthly Status Reporting	Same as above
7. Project Schedule / Milestones / Project Planning	Same as above
8. Vendor Management / Vendor Performance / Vendor Deliverables	Positive–At this phase the project team included several new team members for Proposal evaluation. The additional team members were added relatively seamlessly.
9. Project Communication	Positive–There was constant evaluation team meetings and e-mails

10. Change Management / Change Request	Positive– A formal process was established to review and approve change requests.

Implementation Phase:

Topic	Lessons Learned
1. Project Approval Process	Same as above
2. Managing Sponsor Expectations	Same as above
3. Managing Customer Expectations	Same as above.
4. Risk Management	Same as above
5. Issue Management	Same as above
6. Monthly Status Reporting	None
7. Project Schedule / Milestones / Project Planning	Same as above
8. Resource Management (internal & external resources)	Same as above
9. Project Deliverables (refer to the list of deliverables in the PPM Tool that the PM said would be delivered)	Positive – DIRM had created most of the templates.
10. Project Cost vs. Budget Cost	Neutral – The project was under budget overall. However, the project was slightly over budget for the implementation phase.
11. Change Management / Change Request	Same as above.

Exhibit B

NCIC - Data Management

DOT Criminal Justice Data Integration Initiative

A. What was learned from the project?

CICS Web Services:

1. CICS web services can be a very effective technology solution for leveraging mainframe-based code. They can serve as an intermediary step to moving application logic off of the legacy platform.

2. SOA can be incorporated into future development with typical CRs to help facilitate transition to web services.

3. Some Web Service applications can use mainframe applications “as is”. In other words, one can develop a program that simply interacts with existing applications without modifying them. There is no guarantee that will occur for all mainframe applications that are Web Service enabled, however.

If a terminal driven mainframe application needs to be ported to be a Web Service application, it will require a "clone" of the application. This is because the terminal related commands need to be removed from the application. This is an inherited conflict that can't be easily resolved. More thought must be given to how to handle this situation especially if both will be maintained. The easiest way to handle this would be to modularize the bulk of the application and separate out the presentation portions. This came up when one of the project members was slated to estimate the effort to Web Service enable an existing terminal driven online application. During those discussions, it was realized that a "clone" of the current application would be the better approach than modifying the entire application to distinguish between non-terminal and terminal applications. In fact, we weren't even sure it could have been done. In the case of this project (CJLEADS), it worked because it was a terminal-less application initially.

4. Web services can have a very steep learning curve for mainframe developers unaccustomed to object-oriented and service-oriented application concepts. SOA, web services, SOAP, XML, and tool training in initiation can facilitate development.

5. Using the mainframe, command-line tools is much harder than using better 3rd party tools such as Rational. While tools like Rational are expensive and will require a learning curve as well, the tradeoffs between productivity and development timelines can be significant thus providing a better cost benefit. Also, a tool such as Rational can enhance productivity significantly because of the debugging tools provided by the tool.

6. CTS v4.2 would greatly facilitate web service development. When using v4.1 (as we did) the XML schema definitions cannot contain any nested choice elements. This makes developing an accurate and workable schema very difficult.

7. Due to the nature of the current CICS environment, we were able to develop the Web Service application without resorting to more complicated protocols to communicate between CICS regions. It can be done but the fact it wasn't an issue shortened development time. SADLS and STARS are the two mainframe applications that were joined for CJLEADS. They normally reside in different regions.

8. The use of a tool like Rational for z/os would allow various development approaches and easier integration between mainframe and non-mainframe code bases.

9. When making schema changes, and subsequently regenerating copybooks, be aware of the many possible changes. One example, if a field is changed from required to not required, a –num field will be added to the copybook and can thus throw off the processing of the copybook if this isn't accounted for.

10. Concrete goals with measurable results should be required for each step throughout the project.

11. All mainframe development should include a thorough and specific cost estimate for CPU billing. DMV systems should develop a standard, CPU/maintenance monthly cost estimate that can be included with all future projects when estimating the five year, monthly maintenance cost.

.NET Web Services:

1. An enterprise procedure for developing .NET web services could be produced for use on future projects.

2. A standard, boiler-plate TASD could be created for .NET web services that could be modified for the specifics of each project.

3. A template for infrastructure services for .NET app platforms could be created.

4. Additional documentation on DOT's .NET encryption techniques would be helpful to development teams.

5. A standard PC build image for .NET developers would assist new project teams in getting up to speed quickly.

B. What went well with the project?

1. Having enough "think outside box" type of people to accomplish the task. This was critical as it was a starting from scratch project with no real training in the Web Service environment.

2. The project team overcame a steep learning curve with the new technologies.

3. Making technology decisions at the component level – not at the all or nothing platform level.

4. Interaction between the business, outside agencies, and the project team worked well.

5. The support staff worked very well with the team as questions and problems came up.

6. Having the support organization (integration team and ITS system developers) involved in the early stages kept development moving smoothly.

7. Management support was there from the beginning of the project.

C. What did not go well with the project?

1. More thorough documentation of the development process should have been required.

2. System testing should be performed by a separate testing team, not the component developers. Thorough documentation should be required.

3. External code review would help ensure quality. The developers were left to review each other's code and an outside team should have been enlisted.

4. A bug-tracking/issue tracking tool such as JIRA would better facilitate communications and tracking of testing issues.

5. Compressed timeline necessitated cutting corners on documentation and some functionality.

6. Many bugs were found during user acceptance testing and quality control testing that should have been discovered during system testing.
7. Openness to new approaches and a willingness to learn from the wisdom of others is critical to success.

8. The inability to generate complicated copybooks from XML/SOAP protocols. We had to keep simplifying the XML/SOAP before we had practical and useful copybooks.

D. Words of wisdom for future projects.

1. Enough analysis is done to determine if a mainframe application is suitable as a Web Service application. Careful thought must be given if the mainframe application is a terminal driven application. It will either require extensive modifications or a clone is created with the terminal elements removed.

2. Consider a development toolset to better integrate SOAP, XML, and the mainframe code and platform. This will increase productivity outside the standard mainframe command line tools. The biggest shortcoming of the current tools is the inability to generate complicated copybooks for COBOL programs from standard XML/SOAP protocols.

3. Recommend migration to CTS v4.2.

4. Develop software in short cycles.

5. Utilize continuous integration with short build cycles and iterative testing.

6. Provide structured training in web services, SOAP, and XML prior to initiation.

7. Enterprise code standards for web services need to be developed.

8. Enterprise direction would make services easier to integrate on a system level.

9. Require specific documentation around activities with numerous peer and outside reviews.

Exhibit C

DPI Computerized Instructional Management System (CIMS Pilot)

- Did the project achieve the expected results?

    - The project may not have been achieved in the timeframe that CTE would have liked (it was a semester late), but they were very pleased with the effectiveness of the pilot. Once started, the pilot ran extremely smooth. (Rhonda/Margaret - DPI)
    - The project progressed quite smoothly given the aggressive timeline. (Gary - TG)
    - In his dealings with other schools and being involved with several other pilots, Jeff felt as though the project went well, especially in looking back at all of the accomplishments that were made. (Jeff - TG)

- What were some of the reasons for the project's delays?
    - Internal procurement processes were not documented well. This resulted in a lot of unknowns in regard to solicitations. However, since the project start date, DPI has had the opportunity to document some of these processes which should limit such delays in future projects. (Lucy - DPI)
    - The project team was directed to consider the ACRE initiatives with Accountability Services and whether or not it could collaborate with CTE in the procurement of the tool. Eventually it was decided that CTE could move forward without Accountability Services, but the consideration process certainly contributed to some of the delays. (Beverly - DPI)
    - *Unrealistic time lines can create the perception of failure regardless of what is accomplished. (Corwin – DPI)*
    - *The pilot launched in late January 2010 after a targeted September 2009 start. Our pilot's initial evaluation, vendor remediation, final evaluation, and team recommendation to leadership did not conclude until late May/early June 2010. Some stakeholders never accepted IT's projection (as early as July 09 when there were contract delays with the pilot) that we would easily be facing a 6-month lead time between closing out the pilot and planning/executing a statewide deployment. (Corwin – DPI)*
    - *In the middle of the pilot, some stakeholders transitioned to a Big Bang vs. rolling wave deployment strategy. (This transition had implications for initial costs which required significant negotiation and time to make a statewide financially feasible.) (Corwin – DPI)*
    - *With the NC statewide implementation being Thinkgate's largest ever, TG extrapolated to size the hosting requirements for statewide implementation from existing smaller implementations. (Corwin – DPI)*
    - *The request for ITS quote was a further extrapolation (on the higher side) of what Thinkgate would have asked their ISP (Peak10) to build rather than any hard requirements. Decision was made in early June (presumably b/c of fears of further delays) not to ask Thinkgate to detail server, storage, RAM requirements for various tiers (web, DB, etc.). (Some delay/confusion possibly ensued as a result of this decision as ITS had further questions.) (Corwin – DPI)*
    - *Technical conservations with ITS (regarding statewide deployment) began in June after submitting a 3002 and eventually involved over 20 ITS resources on various conference calls. (Possible issue with over-specialization of technologists when so many people have to be engaged to discuss hosting requirements for a IIS/SQL-based application.) (Corwin – DPI)*
    - *Probably due to lack of DPI budget and time, original plan (pre-pilot authorization) to conduct actual load testing on a built out environment projected to meet pilot requirements (and baseline statewide requirements) was abandoned. When I last engaged on the project, a decision had been made to abandon load testing on a preliminary environment to size for Statewide. (Corwin – DPI)*
    - *IT Leadership and Business leadership should probably negotiate vendor priorities when there is limited time and budget. Some IT (and Security) related activities pursued in the pilot may now in retrospect have little overall value to statewide considerations. Perhaps, the same could be said about some business activities. (Need to identify and ensure highest priorities prerequisite to a Statewide are being pursued in pilot. Push other items to pre-Statewide in the future.) (Corwin – DPI)*

- Were the team's organization, roles and responsibilities clearly defined and understood?
    - In the beginning, there were issues figuring out who was supposed to do what within DPI. It wasn't very clear-cut on who should have been making various decisions. This

produced a lot of "back and forth" communication. If there had been a clearer understanding in the beginning, things would have progressed more smoothly. (Connie - TG)
    - There was a lack of understanding within Thinkgate as well in regards to who did what and who things needed to go through. There were several new people brought into the project team where it wasn't clear who they were and what would be their role. (Rhonda – DPI)

- Were the project documentation/deliverables appropriate? Did they meet expectations?

    - In regards to Thinkgate's Elements Design Documents (EDD), it took a lot of time to get sign-offs by DPI. Thinkgate has learned that it may be better to send the EDDs beforehand and have a walk-through of the document, which could expedite the process of getting sign-offs so that programming could begin. (Connie - TG)
        - In regards to the EDD, there were definitely some misunderstandings between what was thought to be requested and what was actually delivered. (Beverly - DPI)
        - Need to build in more check points to make sure that all requirements are understood. (Jeff – TG)
        - Need a way to build in some flexibility with requirements. Often times, expectations/objectives from DPI shifted and it was very difficult to go back and make modifications to the requirements. (Rhonda - DPI)
    - From a training perspective, it wasn't always known what DPI needed or expected. Therefore, training didn't always coincide with expectations. There definitely needs to be continual dialog in order to meet expectations of DPI. (Pam – TG)
        - Instructional Management Coordinators (IMC) are very experienced in instructional management and Elements better suited them than the old CMS95 application. IMCs were able to learn far more quickly than Thinkgate might have imagined. (Rebecca – DPI)

- Was the DPI implementation plan acceptable? (The implementation plan provided general as well as specific instructions to pilot LEAs in regards to the use and technical requirements of the application.)

    - Yes. (Margaret)

- Were the roles assigned to the project able to carry out their specific responsibilities? Was the project lacking in resources?

    - DPI's technical resources (specifically a systems engineer) were lacking in the beginning but brought into in the project subsequently. (Ken – DPI)
        - Ideally, Ken Thompson would have served in this role, but due to his workload at the beginning of the project, he was not able dedicate a lot of time to it. This was documented as a risk at the beginning of the project. Corwin, however, stepped into this role and provided a lot of technical direction the project needed. Without him, the project probably wouldn't have been able to sustain. (Beverly – DPI)
        - Traditionally, system engineers look at the system elements for capacity planning on a large scale project. Had such a role been involved from the beginning, there would have been a better understanding of what's required to roll out a statewide project. (Ken – DPI)
        - *Broader technical resources engaged around April to help evaluate the success of the pilot and any remediation items. (Per PQMO request/CTO Directive)*

However, no real technical team was assembled to plan and prepare for an actual statewide implementation. (Corwin – DPI)

- The absence of certain roles was not always a case of oversight. There were many concessions made on the project due to DPI's budgetary constraints. Had there been more technical involvement, it might have become unnecessary due to the scaled back approach that was implemented. (Gary – TG)
- There was an awful lot of work required on the security part of the project, which lacked an assigned role. ITS was transitioning their security processes and DPI did not have a security officer at the time (a position that DPI is still trying to fill). So when the project was establishing security requirements, it was somewhat of new territory. Corwin did a wonderful job in documenting and handling security concerns, though it did cost the project time while treading in this new territory. (Lucy – DPI)
    - There was a lot of confusion over the security documentation as to who was the right person to complete it. (Beverly – DPI)

- Did there ever appear to be a lack of technology expertise within the pilot LEAs?

    - Charlotte-Mecklenburg didn't' seem to have a good understanding of the proxy server issues. They didn't realize that the issue was on their end (not Thinkgate's) and it took too much time to fix. (Tom – DPI)
    - Thinkgate's custom profile survey was recently updated and should provide some technical guidance to the LEAs (Connie/Shawn – TG)
        - The documentation should also speak about ports and protocols. (Ken – DPI)

- What can be done to help resolve resource issues in the future?

    - One can either scale back on deliverables or simply increase resources if possible. Also, the business needs to be able to better define what's required in technology projects. In any situation, where resources are lacking and it appears that nothing can be done about it, this should definitely be brought to Peter Asmar's (Chief Information Officer/Associate State Superintendent) attention. (Ken – DPI)
    - Currently, there's no mechanism or tool for determining the level of effort required on a project. Ideally, a time management tool would help in this effort but there aren't any funds to procure such a tool at this time. (Lucy – DPI)
    - When the project charter is developed, it should define who the players are in the project. As part of gate 1, the PM and tasks are defined. As part of gate 2, the matter of resources and when they're needed are defined. This should be signed off on in order to have those resources committed. (Bob – DPI)

- Were the communications appropriate? Did they meet your needs for this project? Was communication effective?

    - Lack of meetings at the beginning of the project really hurt it. Also, those few initial meetings didn't always include the right people. Margaret felt left out so Thinkgate compensated by setting up additional, individual meetings with her. However, as the project got rolling, communication became much better. (Connie – TG)
        - *My sense was that the right the people were in the CIMS meetings during the pilot. However, where there were delays (MFTS, extracts, NCTrust, etc.), often it was because the right people were pulled in so many other directions for other operational and project demands that they could not meet their CIMS commitments in targeted timeframes. (Too much competition for limited hands-on technical resources within DPI and Thinkgate.) (Corwin – DPI)*

        - In the beginning, there were several things going on with the project at the same time and DPI had a skeleton team carrying out tasks. Also, a lot of communication was being funneled through PMs on both sides. However, when the door was opened to allow free form communication, it really improved things. (Beverly – DPI)
    - The use of GForge might have helped in dealing with communication issues in the project. (Ken – DPI)
    - It seemed as though too much time was spent meeting, which reduced the amount of time necessary to carry out tasks. At times, this became very frustrating. (Rhonda – DPI)
        - Excessive meetings were probably the result of lack of defined roles and responsibilities. Therefore, everyone had to come together in order to make a decision. (Ken – DPI)
        - Use of the RACI matrix template would help to define roles and responsibilities. (Bob – DPI)

- Final thoughts/comments?

    - It definitely took a community to bring about the success of the project. Much appreciation goes out to all those involved. (Rebecca – DPI)
    - Angela Blackshaw was the initial PM for the project and was instrumental in getting the RFP written and providing assistance during the beginning phases of the project. Her expertise and work is greatly appreciated. (Beverly – DPI)
    - In terms of tiered support, Tom Hogan was instrumental. He was able to learn quickly and is definitely an asset to the team. (Connie/Shawn – TG)
    - Special thanks to Thinkgate as well as the core DPI team in making the project a success. (Beverly – DPI)
    - *Keep pilot and statewide implementation projects distinct and separate. In some ways, the pilot lessons learned should probably be conducted in advance of initiating a statewide project. Otherwise, the risk is to confuse some of the planning that has yet to be done (but still required) for Statewide with pilot shortcomings. (Corwin – DPI)*

Exhibit D

Department of Agriculture - Automated Emergency Alert System (Knowledge Switch)

Initiation Phase:

Topic	Lessons Learned
1. Business Case / Project Charter	Customer should have spent more time with the vendor defining the scope of the project.
2. Managing Sponsor Expectations	USDA – Grant deadline caused problems. External hours worked were not billed to sponsor because of grant deadline. Emergency Programs billed for hours worked by vendor.

Planning & Design Phase:

Topic	Lessons Learned

1. Project Approval Process	Two meetings were held to evaluate user needs. Use cases should have been more realistic. For example, the Industry Database should not have been used as the basis of the project.
2. Managing Customer Expectations	Vendor and customer should have spent more time collecting user requirements. For example, a better understanding of the plug-ins should have been established in the statement of work.

Execution & Build Phase:

Topic	Lessons Learned
1. Updated Procurement plan	Found it necessary to purchase an Addtran hardware device to connect modem array to server.
2. Managing Customer Expectations	The vendor, Knowledge Vector, performed poorly in managing customer expectations. For example, too much of the programming was done internally by Emergency Programs.
3. Resource Management (internal & external resources)	Customer disappointed in vendor's reliance on internal resources. For example, too much of the internal resources programming time was allocated to plug-ins.
4. Vendor Management / Vendor Performance / Vendor Deliverables	More communication with vendor should have taken place in a team environment rather than communication with a single staff member.
5. Project Communication	Stakeholders and Project team should have been established early in the project life cycle.
6. Development / Build	Knowledge Vector was not successful in meeting our expectations.

Implementation Phase:

Topic	Lessons Learned
1. Project Approval Process	Should have been better communication between internal staff members.
2. Project Deliverables (refer to the list of deliverables in the PPM Tool that the PM said would be delivered)	Beneficial to have more licenses to PPM Tool.
3. Project Cost vs. Budget Cost	Writing software in-house reduced reliance on maintenance agreements.
4. Production Readiness (software / hardware, process, personnel)	User interface should have been user friendly. Administrator intervention necessary.
5. Training (user, admin, etc)	Production readiness issues could have been avoided if additional funds had been made available for training.